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Title : Echolocation click rates and behavior of foraging Hawaiian spinner dolphins (*Stenella longirostris*)

Category : Ecology

Student : Not Applicable

Preferred Format : Oral Presentation

Abstract : To test the hypothesis that spinner dolphins in Hawaii may actively aggregate their prey through cooperative foraging, a 200-kHz multi-beam sonar (Simrad MS2000) was used to observe 323 groups of spinner dolphins foraging at night within a midwater micronekton sound-scattering layer. Strong cooperation was observed in groups of 8-14 pairs of spinner dolphins. Dolphin group size was highest at midnight when the density of prey was highest and was significantly higher in Makua Beach, where prey density was higher, than Electric Beach, where prey density was lower. Cooperative groups of dolphins aggregated their food resources, apparently using their prey's avoidance behavior to create distinct, high-density patches in the prey. Prey aggregation was strongly stereo-typed, regardless of the distribution of the scattering layer. Dolphins swam around the edge of a 28-40 m diameter circle at least 5 times, concentrating prey within this area before pairs of dolphins on opposite sides of the circle swam through the circle, swimming through the high density prey 'donut' they had formed. The diameter of this circle was correlated with the size of the foraging group. Detailed information on dolphin foraging behavior made it possible to correlate echolocation and foraging. During sonar surveys, echolocation click rates were measured from 56 dolphin groups using four hydrophones at 6-m depth intervals. Significant differences in click rates were found between depths and between the different stages of foraging. Click rates were not significantly affected by the number of dolphins. Click rates were relatively low when pairs of dolphins appeared to actively feed. Highest echolocation rates occurred within the scattering layer, during transitions between foraging states. Whistles were only detected when dolphins were not in a foraging formation and when animals were surfacing. This suggests clicks may be used directly or indirectly to cue group movement during foraging.